

ENHANCED MANAGEMENT

By Larry Chase

Nutrition management and lameness in dairy cattle – Many pieces to the puzzle

Lameness in dairy cattle is an expensive and multi-faceted herd health problem. One contributing factor is the nutrition and nutrition management program on the farm. The primary relationship between nutrition and lameness is related to the type and consistency of rumen fermentation. A key factor is rumen pH and acidosis. As the number of hours below a pH of 5.8 increase, the risk of acidosis goes up. The risk of lameness increases as acidosis becomes prevalent.

The first step is to develop a ration with a balance of fiber and rumen fermentable carbohydrates. The challenge is that the target varies depending on a number of factors, such as those in **Figure 1**. As a result, we see a range of values successfully used in healthy high producing herds. The following are starting points for formulation guidelines:

- Ration NDF = 28 – 35% (about 75% or more from forage).
- Forage NDF = minimum of 0.9% of body weight.
- Physically effective NDF (peNDF) = Minimum of 22% for an average rumen pH of 6.
- Starch = 20 - 30%.
- Sugar = 4 – 8%.

The second step is related to feeding and feeding management considerations.

- Use ash corrected NDF values. If high ash forages are used in the ration, total NDF will be overestimated if ash correction is not used. Most forage labs can provide ash corrected NDF values.

- Consider starch fermentability. As starch fermentability increases, more carbohydrate is digested in the rumen and more acid is produced. About 75 - 80% of the starch in the ration should be fermented in the rumen. Buffers should be added to high starch and highly fermentable starch rations.

- Monitor forage dry matters and adjust the amounts of forage added to the TMR to maintain constant pounds of forage dry matter in the ration. Not doing this can

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alter the NDF to starch.

- Check the particle size of the TMR to make sure particle size is not reduced during the mixing process. This can be done by making a one cow mix and mixing it with a fork or shovel. Check the particle size of this mix versus the mix made in the TMR mixer. Overmixing can reduce particle size in auger type mixers.

- Check the consistency of the TMR delivered along the length of the feed bunk. Does the feed

look “similar” along the length of the bunk? The Penn State Particle Separator could also be used to quantify this.

- Look at the feed refusals! Do they appear sorted with only long, coarse particles? If so, the ration consumed may be different in NDF and starch than formulated for and could alter rumen fermentation.

- Encourage more uniform feed consumption. Frequent feed pushups will help. Recent work indicates that pushing feed up in the first one to two hours after feeding may be beneficial.

- Does the ration mixed and delivered match the ration formulated? TMR analysis may be a tool assess this.

- Overcrowding – This can change meal patterns and meal size, may lower rumen pH, and can increase the risk of acidosis. This may be a larger problem in mixed parity pens. First lactation cows may be at higher risk of acidosis in this situation.

- Transition rations – Be careful not to make large and rapid changes in ration starch content between the pre-calving and fresh cow rations. A guideline is to have the difference in starch content of these rations be 10% different.

- Think like a rumen bug – What can you do to provide the most consistent ration and feeding system to minimize variation in the rumen environment? □

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